

Response under 37 CFR 1.111
Serial No. 10/617,741
Attorney Docket No. 030793

REMARKS

Claims 1 - 24 are pending in the present application, of which claims 9-24 have been withdrawn from consideration. By this Amendment, claims 3, 4 and 6 have been amended into independent form. No new matter has been added. It is respectfully submitted that this Amendment is fully responsive to the Office Action dated July 7, 2005.

Allowable Subject Matter:

Applicant gratefully acknowledges the indication in item 8 of the Action that claims 3, 4, 6, 7 and 8 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Accordingly, each of claims 3, 4 and 6 has been amended into independent form to include the features of base claim 1 and any intervening claims. As such, it is submitted that independent claims 3, 4 and 6 are now allowable. In addition, it is submitted that claims 7 and 8 are also allowable by virtue of respective dependency on allowable independent claim 6.

Specification (Abstract):

The Abstract stands objected to due to the minor informalities specified in item 3 of the Action. However, it is respectfully submitted that the Abstract has been amended to correct such informalities. Accordingly, withdrawal of this objection is respectfully requested.

As to the Merits:

As to the merits of this case, the Examiner sets forth the following rejections:

1) claims 1 and 2 stand rejected under 35 USC §102(b) as being anticipated by Kjong-Rasmussen (U.S. Patent No. 6,658,877);

2) claim 5 stands rejected under 35 USC §103(a) as being unpatentable over Kjong-Rasmussen in view of Kleppner (U.S. Patent No. 5,901,742).

Each of these rejections is respectfully traversed.

Claim 1 calls for *that the differential pressure control valve is configured to receive an inlet pressure of the refrigerant inlet in a valve-closing direction and at the same time receive an intermediate pressure between the restriction and the differential pressure control valve in a valve-opening direction, with a pressure-receiving portion for receiving the inlet pressure being fluidly isolated by a diaphragm.*

With regard to these features of claim 1, the Examiner asserts that Kjong-Rasmussen discloses that the differential pressure control valve 125 is configured to receive an inlet pressure of the refrigerant inlet in a valve-closing direction (via a chamber 130 when control valve 104 is closed) and at the same time receive an intermediate pressure between the restriction 123 and the

differential pressure control valve 125 in a valve-opening direction, with a pressure receiving portion for receiving the inlet pressure being fluidly isolated by a diaphragm 127.¹

It is respectfully submitted that 1) The valve element 125 of Kjong-Rasmussen opens and closes according to the balance between the force of the differential pressure between the high-pressure side 110 and the low-pressure side 109, the force of the spring 126, and the force transmitted by the diaphragm 127 operating within the diaphragm capsule 120.

However, the valve element 125 does not operate to make constant the differential pressure between the high-pressure side 110 and the low-pressure side 109, that is, the differential pressure across (between opposite sides of) the valve element 125 (in other words, the differential pressure across the connection channel 123).

In short, the valve element 125 is not a differential pressure control valve, to begin with.

2) As stated in the above 1), the valve element 125 of Kjong-Rasmussen does not operate to make constant the differential pressure thereacross. Therefore, even if the cross-sectional area of the connection channel 123 is fixed, the expansion valve 105 does not hold constant the flow rate of refrigerant allowed to flow downstream of the valve element 125.

¹ Please see, lines 15-21, page 3 of the Action.

That is, the expansion valve 105 is not a constant flow rate expansion valve, to begin with.

3) The pressure in the connection channel 123 is equal to the pressure in the inlet pressure, so that the connection channel 123 by itself hardly contributes to a decrease in pressure, and hence does not form a restriction. That is, the Examiner is mis-characterizing the teachings of Kjong-Rasmussen. More specifically, while Kjong-Rasmussen may disclose a restriction 131 of the high-pressure control line 116, the connection channel 123 does not form a restriction.

4) The restriction 131 of Kjong-Rasmussen has nothing to do with the flow rate of refrigerant which is allowed to flow downstream of the valve element 125.

When the solenoid valve 104 is open, the restriction 131 prevents the pressure in the working pressure chamber 130 from increasing due to the influence of the pressure on the high-pressure side 110 to thereby hold it substantially equal to the pressure on the low-pressure side 109 (column 5, line 58 - column 6, line 4). Further, the restriction 131 causes pressure in the working pressure chamber 130 to be built up when the solenoid valve 104 is closed, to move the diaphragm 127 upward, thereby causing the valve element 125 to operate to close (see column 6, lines 20-34).

Therefore, the differential pressure across the restriction 131 is not held constant. That is, the valve element 125 does not make constant the differential pressure across the restriction 131.

Further, the pressure in the working pressure chamber 130 is neither the inlet pressure nor the intermediate pressure.

That is, while Kjong-Rasmussen may disclose that when the valve 104 is closed, the pressure in the working pressure chamber 130 increases, which causes the diaphragm 127 to be pressed upwards, which causes the expansion valve to close (see, lines 20-33, col. 6), the pressure in the working chamber 130 is neither the inlet pressure nor the intermediate pressure.

As such, it is respectfully submitted that Kjong-Rasmussen fails to disclose or fairly suggest the features of claim 1 concerning *that the differential pressure control valve is configured to receive an inlet pressure of the refrigerant inlet in a valve-closing direction and at the same time receive an intermediate pressure between the restriction and the differential pressure control valve in a valve-opening direction, with a pressure-receiving portion for receiving the inlet pressure being fluidly isolated by a diaphragm.*

In view of the aforementioned amendments and accompanying remarks, Applicants submits that that the claims, as herein amended, are in condition for allowance. Applicant requests such action at an early date.

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If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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